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A NEW GENUS AND SOME NEW SPECIES AND SUBSPECIES OF AMERICAN HESPERIIDAE (LEPIDOPTERA, RHOPALOCERA)

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This paper deals with certain HesperIIDae encountered in a study of the Antillean fauna. The forms described either occur in the Antilles or are closely related to species occurring in those islands. With the exception of some material borrowed elsewhere for study the following descriptions are made from specimens in the collection of the American Museum of Natural History. The borrowed specimens, when included in the type material, are noted in their respective places and will be returned to their owners.

We express our thanks for the loan of specimens from the Academy of Natural Sciences of Philadelphia, Pennsylvania, through Mr. E. T. Cresson, Jr.; the Museum of Comparative Zoölogy, Cambridge, Massachusetts, through Mr. V. Nabokov; the Reading Public Museum and Art Gallery, Reading, Pennsylvania, through Mr. L. S. Dillon; and Mr. F. E. Church, Mr. A. L. Stillman, and Mr. Cyril F. dos Passos.

Where reference is made to the venation of the wings by number, it follows the English system of numbering the veins of each wing from the lowest vein upward.

Mrs. Dorothea K. Barlow of the Illustrators Corps of the American Museum of Natural History made all the drawings and arranged the figures illustrating this paper.

***Chioides catillus churchi*, new subspecies**

MALE AND FEMALE: Both sexes differ from *Chioides catillus catillus* Cramer (1779, vol. 3, p. 119, pl. 260, figs. F, G) in the

slightly smaller size and correspondingly shorter tails; in the darker ground color of both surfaces of the wings; in the larger and more deeply yellow hyaline discal spots of the primaries and in the slightly smaller subapical spots of these wings.

On the under side the grayish white overscaling in the apical area of the primary, while variable, is a little heavier than usual in this same area of *catillus*. The subbasal dark brown band of the secondary is more continuous and of a solid color and does not tend to be broken into a series of spots varying in shade as is often found in *catillus*. The gray band, outwardly bordering the subbasal dark brown band, is narrower and the sides are straight and even, not irregular as in *catillus*.

Length of one primary wing: male, 23 to 26 mm.; female, 26 to 28 mm.

TYPE MATERIAL: All from Jamaica, British West Indies. Holotype, male, and allotype, female, Baron Hill, March 19, 1931, and June 30, 1930. Paratypes: three males, Baron Hill, March 19, 1931, and July, 1930; one male, Claremont, August; one male, Bath, St. Thomas, February 2-4, 1920; nine males, Montego Bay, January, 1939, and March 6-26, 1939. The following paratypes are in the collection of Mr. F. E. Church: three males and one female, Montego Bay, January, February 18, 1939, and March 6, 1939.

This subspecies is named for Mr. F. E. Church who collected many of the specimens and who has generously donated much material to the American Museum of Natural History from his collections made in the West Indies.

The male genitalia are approximately the same as those of *catillus*.

***Proteides mercurius vincenti*, new subspecies**

MALE AND FEMALE: In comparison with the several known subspecies of *Proteides mercurius* Fabricius (1787, p. 86) inhabiting various islands of the West Indies the subspecies from St. Vincent most nearly resembles *Proteides mercurius pedro* Dewitz (1877, p. 242) from Puerto Rico and *Proteides mercurius angasi* Godman and Salvin (1884, p. 318, pl. 25, fig. 2) from Dominica and Martinique.

From *pedro* it may be distinguished by the darker shade of the ground color of the upper side and the less extensive fulvous scaling of the basal area of all wings. The hyaline spots of the discal

band of the primary are much less developed, and all are very small except that one in interspace 2 which is the largest, standing out prominently. On the under side of the secondary the dark brown spots of the discal band in the upper part of each wing are smaller, and the V-shaped spot in the lower part of each wing is narrower.

From *angasi* it may be distinguished by the lighter shade of the ground color of the upper side of the wings. The hyaline spots of the discal band of the primary differ as they do in *pedro*. On the under side of the primary the apical area, beyond the discal band of hyaline spots, is bright bronze brown with a violet reflection, much brighter than this area in *angasi*. On the under side of the secondaries the ground color is much brighter; there are only two dark brown spots in the discal band, the upper one small and the one below it only indicated. The V-shaped spot is much narrower than in *angasi*.

Length of one primary wing: male, 28 mm.; female, 32 mm.

TYPE MATERIAL: Holotype, male, and allotype, female, St. Vincent, British West Indies (E. B. Isaacs).

The male genitalia are virtually the same as those of *mercurius*.

***Proteides mercurius sanchesi*, new subspecies**

MALE AND FEMALE: In comparison with the other known subspecies of *Proteides mercurius* Fabricius from other West Indian islands, *sanchesi* from Hispaniola differs from *Proteides mercurius pedro* Dewitz from Puerto Rico, *jamaicensis* Skinner (1920, p. 133) from Jamaica, *angasi* Godman and Salvin from Dominica and Martinique, and the above-described *vincenti* from St. Vincent in the greatly developed grayish white spot on the under side of the secondary. This spot is entirely lacking or only indicated by scattered scales in the four other Antillean subspecies mentioned, and although there are other differences in maculation, this one character will separate *sanchesi* from any of these other subspecies.

The subspecies *san antonio* Lucas (1857, p. 626) from Cuba has the grayish white spot on the under side of the secondary, but it is less heavily developed and more like that of typical continental *mercurius*. In *san antonio* the costal spot of the discal band of hyaline spots on the primary is present but all of the other usually present spots of the band are absent or only occasionally indicated. In *sanchesi*, the whole discal band is as fully developed as in typical *mercurius*.

On the upper side *sanchesi* is very similar to typical *mercurius*, but the fulvous scales of the thorax and basal areas of the wings are of a little duller shade and they are less extensive on the wings. On the under side of the wings, *sanchesi* differs from *mercurius* in that the violet gray overscaling on the apical area of the primary is much reduced or absent and in that the outer marginal band of scales on each wing is narrower and less defined. On the secondary the outer marginal area is entirely dark or only lightly overscaled with violet gray; also the grayish white discal area forms a well-defined spot between the lower edge of the dark brown basal spot and the V-shaped spot. The dark brown basal area is more extensive, and the V-shaped spot is approximately twice as wide and solid in color, not shaded as in *mercurius*. The dark brown discal spots are well defined and prominent.

Length of one primary wing: male, 28 to 30 mm.; female, 32 to 34 mm. (one very small female, 26 mm.).

TYPE MATERIAL: Holotype, male, Pétienville, Haiti, June 14, 1930; allotype, female, Sanchez, Dominican Republic, May 11-16, 1915. Paratypes: two males, Port-au-Prince, Haiti, April 5-11, 1922; two females, Pétienville, Haiti, June 8 and 13, 1930; three females, Sanchez, Dominican Republic, May 22-27, 1915, and June 19-23, 1915.

The male genitalia do not materially differ from those of *mercurius*.

***Polygonus manuei*, new species**

Figure 1

MALE AND FEMALE: The upper side of the primaries is velvety black with a metallic blue sheen which is brightest in the basal area of the wings. There are long brown scales over the metallic blue basal area and along the inner margin. The outer margin of the wings is lightly overscaled with brown which forms a pale submarginal band. On each primary, there are three somewhat quadrate white hyaline subapical spots, the lower one the largest, and three white hyaline discal spots, one in the cell a little incised on the outer side and one each in interspaces 2 and 3. The pale brown fringes are crossed by darker brown at the veins in the apical area.

The secondaries are brown with a darker brown marginal band, and there are somewhat indistinct, narrow, discal and subbasal darker bands. The fringes are of the same color as those of the

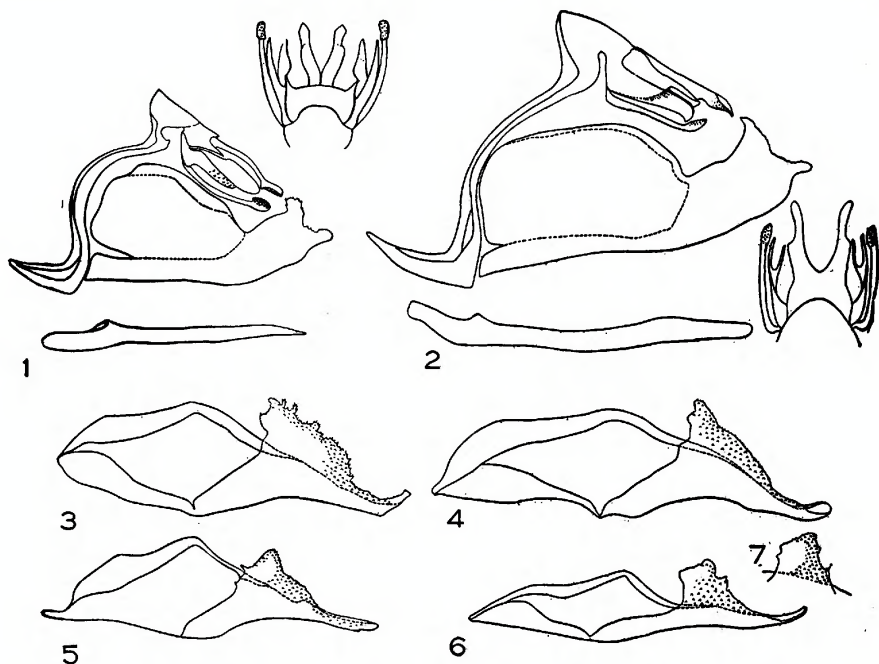


FIG. 1. *Polygonus manuelei*, new species. Brazil. Left lateral view of male genital armature with aedoeagus and dorsal view of uncus and scaphium.

FIG. 2. *Polygonus lividus* Hübner. Virgin Islands. Left lateral view of male genital armature with aedoeagus and dorsal view of uncus and scaphium.

FIG. 3. *Echelatus sempiternus dilloni*, new subspecies. Haiti. Lateral view of left clasper, with very irregular process.

FIG. 4. *Echelatus sempiternus dilloni*, new subspecies. Haiti. Lateral view of left clasper, with a more regular process.

FIG. 5. *Echelatus sempiternus* Butler and Druce. Costa Rica. Lateral view of left clasper.

FIG. 6. *Echelatus sempiternus dilloni*, new subspecies. Jamaica. Lateral view of left clasper.

FIG. 7. *Echelatus sempiternus dilloni*, new subspecies. Jamaica. Showing modification of the process.

primaries but are a little darkened at the ends of the veins in the upper half of the wings.

On the under side of the primaries all the hyaline spots of the upper side are repeated. The apical area and outer margin are fulvous brown with a violet or steel blue reflection along the costal margin and before the subapical spots. The outer margin is narrowly fulvous brown followed internally by a single narrow, wavy, brown band from the costal margin to the inner margin, which is extended along the veins to the outer margin and thus

cuts the marginal fulvous band into a series of spots. The submarginal brown band is bordered internally by another fulvous brown band. The inner margin is pale brown, and all other areas of the wing are blackish brown.

On the under side the secondaries are fulvous brown suffused with a violet or steel blue sheen. There is usually a small, dark brown spot near the base of the wings, but this may be absent. There are moderately broad discal and subbasal brown bands and a very narrow, wavy, submarginal brown band which, being produced outwardly along the veins, cuts the paler fulvous brown border into a series of spots. The anal area is dark brown.

The top of the head, thorax, and the base of the abdomen are bronze brown with a green sheen. On the under side, the palpi and pectus are brown intermixed with pale fulvous scales with the thorax and abdomen fulvous brown. The antennae are black on the upper side, blackish brown on the under side with the club red.

Length of one primary wing: male, 19 to 23 mm.; female, 22 to 23 mm.

TYPE MATERIAL: Holotype, male, New Bremen, Brazil; allotype, female, Hansa Humboldt, Brazil. Paratypes: one male, Royal Palm Hammock, Florida, February 25, 1920 (W. C. Wood); two males, Yacasay, Campeche, Mexico, March 24, 1928 (C. C. Hoffmann); two females, Candelaria, Campeche, Mexico, November and December, 1944; one female, Morales, Guatemala, April; one female, Mototan, Trujillo, Venezuela, (P. J. Anduze); one male, St. Laurent, Cayenne; one male, Iquitos, Peru. All from Brazil: one female, Para; one male, Rio de Janeiro; one male, Tijuca; two males and one female, Massaranduba-Blumenau; one male, Hansa Humboldt; one male, New Bremen, February 3, 1932; one male, New Bremen (Rio Laeiss), Munic. Blumenau; one female, Mafra, March; one male and two females, Annaburg.

This species has long been confused with *Polygonus lividus* Hübner (1819, Verzeichniss, p. 103, no. 1093; 1825, Sammlung, vol. 2, pl. [144], figs. 1-4) which it closely resembles in external characters. On the upper side of the wings *manueli* differs from *lividus* in the less extensive metallic sheen of the primaries and in the more distinct submarginal pale brown band. On the secondaries the dark bands are more prominent. The fringes of both wings are somewhat darker.

On the under side of the wings *manueli* differs from *lividus* in

the much paler ground color. Furthermore, the metallic sheen, so prominent in *lividus*, is much reduced and varies with the angle in which the wings are viewed. The dark brown spot near the base of each secondary is very small or absent in *manueli*. The body and legs of *manueli* are fulvous brown, not gray as in *lividus*, and the palpi are more tawny.

The male genitalia of *lividus* and *manueli* are of the same form but they differ materially in details. In *lividus* (fig. 2) the apex of the uncus projects considerably beyond the scaphium; the two terminal prongs at the apex of each clasper are sharply pointed and the aedoeagus is not sharply tapered. In *manueli* the uncus and the scaphium are of nearly equal length; the terminal prongs of the claspers are blunt or rounded and the aedoeagus is sharply tapered. Godman and Salvin (1893, vol. 3, pl. 77, fig. 9) appear to have figured the male genitalia of *manueli* as those of *lividus*.

On the mainland the range of *manueli* is from Florida through Mexico and Central America to southern Brazil in South America, and it thus parallels that of the continental subspecies of *lividus*. In the Greater Antilles where *lividus* occurs, *manueli* appears to be absent, but it appears in the Lesser Antilles in subspecific form whence we have no records of *lividus*.

Within the continental range of *manueli* there occur individuals which differ from the typical form in their average smaller size, much paler ground color of both surfaces of the wings, proportionately longer and narrower primaries, and the relatively larger average size of the hyaline spots of these wings. There are occasional individuals with a slightly darker ground color of the wings, but still paler than typical *manueli*, which seem to represent intergradation between the two forms. The male genitalia of the pale form do not differ from those of typical *manueli*. As the data accompanying the specimens are not sufficient for the taxonomic position of this pale form to be determined, we refrain from applying a distinctive name to it.

***Polygonus manueli punctus*, new subspecies**

MALE AND FEMALE: This subspecies of *manueli* differs from the typical form in having the hyaline spots of the primaries much reduced in size and in having less metallic sheen on the basal area of the upper side of these wings. The ground color of the under side of all wings is usually a little paler, especially on the secondaries, although some individuals approximate *manueli* in color.

On the under side the palpi, the pectus, and the thorax are more fulvous than in *manueli*.

Length of one primary wing: male, 19 to 22 mm., female, 21 to 23 mm.

TYPE MATERIAL: Holotype, male, St. Vincent, British West Indies; allotype, female, Canefields, Dominica, British West Indies, January 2-9, 1934. Paratypes: two males, St. Vincent; one male and five females, Canefields, Dominica, October 24-31, November 22-30, 1933, and January 10-16, 1934. Additional paratypes are in the collection of the Reading Public Museum and Art Gallery, Reading, Pennsylvania: three males and three females, La Haut, Dominica, December 20, 26, 30, 31, 1944, January 24 and February 11, 1945.

The male genitalia do not differ from those of *manueli*.

***Echelatus sempiternus dilloni*, new subspecies**

Figures 3, 4, 6, 7

MALE AND FEMALE: This subspecies differs from *Echelatus sempiternus sempiternus* Butler and Druce (1872, p. 114) described from Costa Rica in that the extensive area of bluish white over-scaling on the posterior parts of the under side of the secondaries of *sempiternus* is reduced to scattered scales of this color in the basal part of the abdominal fold and thus more nearly resembles *Echelatus sempiternus simplicior* Möschler (1876, p. 342, pl. 4, fig. 27) which has this over-scaling greatly reduced or almost absent.

On the upper side of the wings *dilloni* differs from *simplicior* in having a somewhat paler brown ground color. The outer margin of the primary is broadly darker, and there is no marginal band of pale spots as in *simplicior*. All of the maculation of both the primaries and the secondaries is much less distinct. The discal area of the primary of the female is paler than that of the male, and the maculation is more distinct, but the apical area is broadly dark colored and does not show the two dark bands as in *simplicior*.

On the under side of all wings of the male the maculation is less distinct than in *simplicior*. The females have the maculation a little more distinct than the males, but the apical area of the primary is broadly dark colored as on the upper side, and the pale yellow spot near the apex is very prominent.

Length of one primary wing: male, 19 to 21 mm.; female, 20.5 to 24 mm.

TYPE MATERIAL: Holotype, male, Pétionville, Haiti, May 25, 1930; allotype, female, La Romona, Dominican Republic, January 13, 1915. Paratypes: one male and two females, Aux Cayes, Haiti, March 15-22, 1922; one female, Santiago, Cuba; one male, Baron Hill, Jamaica, June, 1930; two males and one female, Baron Hill, Trelawney, Jamaica, June 29, July 20, October 22; six males and one female, Claremont, Jamaica, January, June, July, September, July 3, 1929; one female, Montego Bay, Jamaica, February 13, 1939; three males, Jamaica without definite locality, June.

This subspecies is named for Mr. Lawrence S. Dillon of the Reading Public Museum and Art Gallery, Reading, Pennsylvania.

The male genitalia show a slight modification in the dorsal projection of the claspers but otherwise are very similar to those of *sempiternus* (fig. 5) and the subspecies *simplicior*. This dorsal projection varies a little in individuals from the different islands.

Möschler, in his description of *simplicior*, stated that his type material was a male from Paramaribo, Dutch Guiana, and a female from Cuba. As he did not designate either as the type, we select the male from Paramaribo as the lectotype of *simplicior*. The female, which Möschler possessed, from Cuba apparently belongs to the new Antillean subspecies, *dilloni*.

***Achylodes janus*, new species**

Figure 8

MALE: This species closely resembles *Achylodes papinianus* Poey (1832, pp. [11-14], pl. [47]) from Cuba and Hispaniola and the subspecies *papinianus minor* Comstock (1944, p. 552, pl. 2, fig. 1, pl. 11, fig. 8, text fig. 27) from Puerto Rico, Virgin Islands, Dominica, and Guadeloupe. The outer margin of the primary of *janus* is less rounded and the outer margin of the secondary is noticeably angled between veins 2 and 4, giving these wings a somewhat quadrate appearance. In *papinianus* and *minor* the outer margin of the secondary is evenly rounded.

The maculation of the upper side of all wings of *janus* is virtually the same as that of *papinianus* and *minor* except for the hook-shaped spot projecting downward from the apical half of the costal margin of each primary which is less apically produced and less

sharply pointed than is the case in most of the individuals of *papinianus*. On the under side of the wings *janus* lacks the bluish gray overscaling which is prominent on the posterior parts of the secondaries in *papinianus* but less so in *minor*.

On each hind tibia of *papinianus* and *minor* there is a slender hair tuft which is inserted into a cavity at the base of the abdomen. This hair tuft is lacking in *janus*.

Length of one primary wing: male, 21 to 24 mm.; female, 24 to 26 mm.

TYPE MATERIAL: All from Jamaica, British West Indies. Holotype, male, Claremont, February; allotype, female, Baron Hill, Trelawney, July 16. Paratypes: two males and one female, Claremont, July 1 and 30; one male, Baron Hill, Trelawney, June; one male, Dunrobin District, Mandeville, Manchester, December 1, 1920, about 2350 feet; one female, Constant Spring, St. Andrew, January 25, 1920. Additional paratypes are in the collection of Mr. F. E. Church: three males, Montego Bay, February 26, March 19 and 26, 1939; one female, Reading, St. James, December 18, 1938.

The male genitalia of *janus* are materially different from those of *papinianus* and *minor* (fig. 9).

Panton (1897, p. 435, pl., figs. 1-3) under the name of *Achlyodes philemon* Fabricius described the egg, larva in several stages, and the pupa and figured the larva, pupa, and the female imago and gave orange and lemon leaves as the food plant of a hesperid we believe to be *janus*. *Papilio philemon* Fabricius (1775, p. 534), now considered to be a synonym of *Ephyriades arcas* Drury (1770, p. 38), is a species not occurring in Jamaica as far as we know.

Kaye (1926, p. 494) recorded from Jamaica *Eantis thraso* Hübner (1807, Sammlung, vol. 1, pl. [151], figs. 1-4) and under it, as synonyms, placed *Hesperia papinianus* Poey and *Achlyodes philemon* Panton and stated that *papinianus* is the female of *thraso*. However, *thraso* and *papinianus* are distinct species, and we have no records of the occurrence of either of them in Jamaica, thus in all probability Kaye's record refers to *janus*.

BURCA, NEW GENUS

This genus is erected to receive four species of Antillean Hesperidae: *Nisoniades concolor* Herrich-Schäffer, *Nisoniades braco* Herrich-Schäffer, both described from Cuba, and the following two newly described species from Hispaniola. The two Herrich-

Schäffer species, *concolor* and *braco*, have been placed in other genera by other authors.

MALE: Primaries. The costal margin is slightly curved, the outer margin rounded, the apex more or less sharply pointed. The secondary sexual characters are variable. In *concolor* a patch of modified scales lies in about the center of the area between the base of the wing and the outer margin from just under vein 2 to just below vein 1 and covers three narrow black stripes which sometimes show a thin, grayish central line. The upper stripe lies just below vein 2, the next stripe lies along the upper side of vein 1, the lowest stripe lies along the under side of vein 1. There is no costal fold. In *braco* the patch of modified scales is

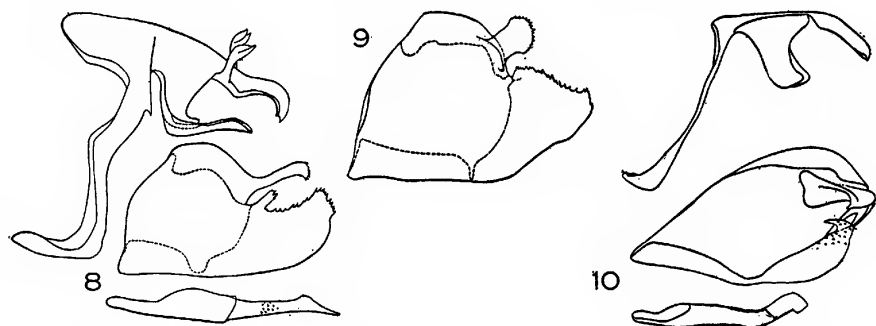


FIG. 8. *Achlyodes janus*, new species. Jamaica. Left lateral view of male genital armature with structures detached.

FIG. 9. *Achlyodes papinianus minor* Comstock. Puerto Rico. Left lateral view of clasper.

FIG. 10. *Burca stillmani*, new species. Dominican Republic. Left lateral view of male genital armature with structures detached.

confined to the area between veins 1 and 2, and these scales cover only two narrow stripes instead of three as found in *concolor*, the one below vein 1 being absent, and there is a costal fold enclosing a hair tuft which emanates from the basal end of the fold. If the fold is tightly closed the hair tuft may not be visible. In the two newly described species one possesses the same sexual characters as *concolor*, and the other one has the costal fold enclosing a hair tuft as found in *braco*, but it has no patch of modified scales.

Secondaries. The outer margin is slightly angled between veins 3 and 4.

The antennae are a trifle longer than half the length of the costal margin of the primaries, and the club is gradually thickened and

tapers to a pointed apex. The third joint of the palpi is short, conical, and porrect. Each hind tibia has two pairs of spurs and is without a hair tuft.

The great similarity in the form of the uncus, scaphium, and claspers of the male genitalia of these four species indicates their close generic alliance.

FEMALE: In the wing shape and other structural characters the female is similar to the male, but of course the secondary sexual characters found on the primaries of that sex are absent.

GENOTYPE: *Nisoniades concolor* Herrich-Schäffer.

The position of the genus *Burca* is near the genus *Pholisora* Scudder (1872, p. 72), from the type (*Hesperia catullus* Fabricius) of which it differs in having the primaries more sharply pointed and the secondaries more produced anally. In the male genitalia the long undivided uncus of *Burca* differs from the shorter, divided uncus of *Pholisora caluttus*.

***Burca stillmani*, new species**

Figure 10

MALE: The upper side of all wings is blackish brown, a little paler towards the outer margins. In each primary there are usually from one to three white subapical spots, variable in size but generally small, and these may be absent. There is a short costal fold enclosing a tuft of hairs arising from the base of the fold, which at times, when the fold is tightly closed, is entirely concealed. The fringes are a little paler than the ground color of the wings and tend to become white at the extreme tips.

The secondaries are immaculate; the fringes are whitish and crossed by brown at the ends of the veins.

On the under side the ground color of all wings is paler than on the upper side. The inner margin of the primary is pale brown; the subapical spots are present on the under side in those individuals in which they occur on the upper side; there are some rusty red scales in the apical area and some pale brown or grayish scales along the outer margin and on the base of the fringes. The secondaries have an intricate pattern of dark bands which are sometimes indistinct, and in the discal and outer angle areas there are sometimes rusty brown or red brown scales, but these may be absent. There is a variable overscaling of grayish white which sometimes accumulates to form a white bar at the end of the cell,

but in some individuals, especially if worn, the overscaling is much reduced or absent.

The upper side of the head and thorax is fulvous brown, and the abdomen is blackish brown. On the under side, the palpi and pectus are white or yellowish white with some black hairs intermixed; the thorax is gray and the abdomen is pale brown, sometimes with gray scales intermixed. The antennae are black on the upper side and pale brown spotted with whitish at the joints on the under side; the club is whitish at the base, the remainder red.

FEMALE: The ground color of the upper side of the wings is similar to that of the male, perhaps just a shade lighter. Each primary has three white subapical spots. The secondaries are immaculate.

On the under side of each primary there is sometimes an overscaling of dark red at the apex which may extend narrowly along the outer margin, but this may be absent. On the under side of each secondary, in the discal and outer angle areas, there is an overscaling which varies from red brown to dark red which sharply contrasts with the color of the rest of the wing, but in some individuals this overscaling may be entirely absent.

Length of one primary wing: male, 14 to 16 mm.; female, 17 to 18 mm.

TYPE MATERIAL: All from the Dominican Republic. Holotype, male, and allotype, female, Rio Yaque, 10 miles south of Monte Christi, February 25 and 23, 1931. Paratypes: one female, Monte Christi, May 6, 1915; nine males, Rio Yaque, 10 miles south of Monte Christi, March, 1930, February 23, 25, 1931; three males, 8 miles south of Monte Christi, February 24, 1930; five males, near Monte Christi, March 13, 1931; two females, 1 mile east of Monte Christi, March 6, 1931; one male, Monserat, July 20-22, 1932. The following paratype is in the collection of the Academy of Natural Sciences of Philadelphia, Pennsylvania: one male, Rio Yaque, 10 miles south of Monte Christi, February 23, 1931.

This species is named for Mr. A. L. Stillman, who collected most of the specimens.

A somewhat larger species, having on the primaries of the male a similar costal fold enclosing a hair tuft, is *Burca braco* Herrich-Schäffer (1864, p. 171) from Cuba. On each primary of *braco* there are two patches of modified scales, the upper one lying along vein 2 and the lower one along vein 1, both in about the center of

each of those veins. These patches of modified scales are absent in *stillmani*: thus this one character will immediately separate the males of the two species.

The females of *braco* are distinguished from those of *stillmani* by the more mottled appearance of the upper side of all wings due to the dark bands with lighter intervals between them. On each primary of *braco* in addition to the three or four subapical spots there are one or two small white discal spots, the larger one in interspace 3 and the smaller one in interspace 2. On the under side of the wings of *braco* the primaries have the spots of the upper side repeated and sometimes additional small spots in interspaces 4 and 5. The secondaries are evenly overscaled with red, and there is no gray overscaling. The palpi and pectus are not so purely white.

The male genitalia of *stillmani* differ from those of *braco* (fig. 11).

***Burca hispaniolae*, new species**

Figure 12

MALE: The ground color of the upper side is brown. There is a variable overscaling of gray on the outer marginal area which may be absent in worn individuals. Each primary has from two to three small, subapical white spots in an oblique line, and there may be two small, discal, white spots, one each in interspaces 2 and 3, or only the upper one, or there may be none at all. There is a submarginal band of lighter color beginning narrowly at the costal margin and passing outside of the subapical spots and then widening as it extends downward to the inner margin. The area of modified scales is similar to that of *Burca concolor* Herrich-Schäffer (1864, p. 171). The fringes are brown, lightly intermixed with yellowish fulvous scales.

The secondaries have indistinct traces of narrow submarginal, discal, and subbasal bands. The fringes are as on the primaries.

On the under side the ground color is a little paler than on the upper side. The primaries have the white spots of the upper side repeated, and the inner margin is narrowly paler than the rest of the wings. The secondaries are overscaled, sometimes very heavily, with grayish fulvous, and the narrow dark bands are very indistinct.

On the upper side the palpi and the head are fulvous and brown intermixed; the body is brown. On the under side the palpi and pectus are white or yellowish white with some dark scales inter-

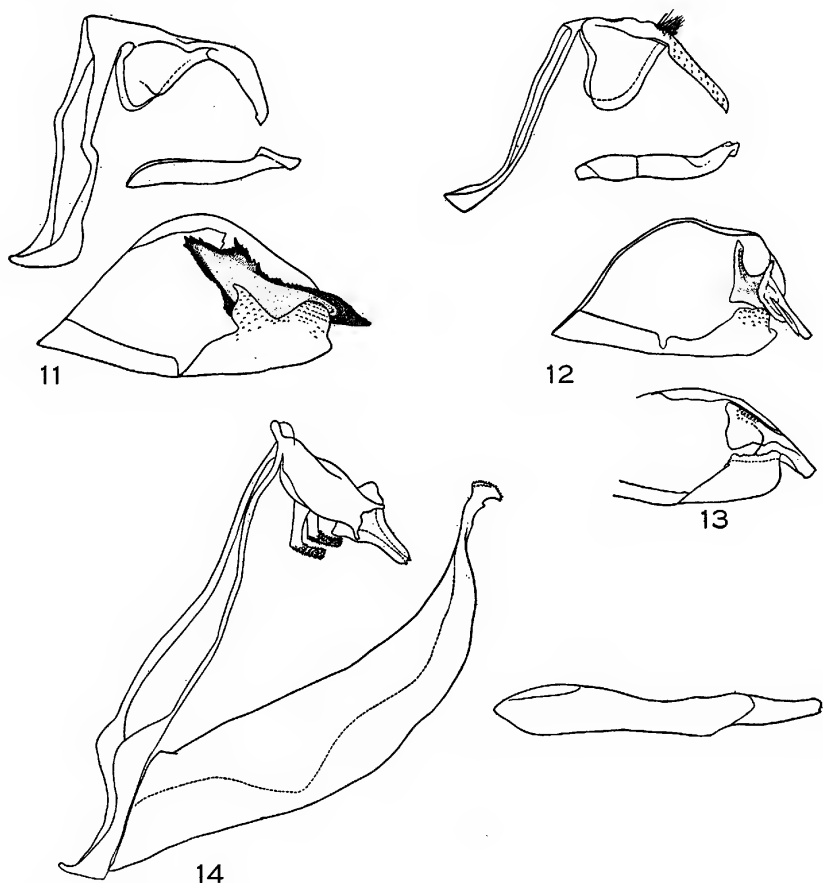


FIG. 11. *Burca braco* Herrich-Schäffer. Cuba. Left lateral view of male genital armature with structures detached.

FIG. 12. *Burca hispaniolae*, new species. Haiti. Left lateral view of male genital armature with structures detached.

FIG. 13. *Burca concolor* Herrich-Schäffer. Cuba. Left lateral view of clasper.

FIG. 14. *Ephyriades dominicensis*, new species. Dominica, British West Indies. Left lateral view of male genital armature with structures detached.

mixed. The thorax and the abdomen are grayish fulvous. The antennae are black on the upper side and are lightly spotted with fulvous brown on the under side. The club is fulvous brown with the apiculus red.

FEMALE: The upper side of the primary shows traces of narrow, darker discal and subbasal bands. The pale submarginal band is more sharply contrasted with the dark ground color. The

subapical and discal white spots are larger than those of the male, and sometimes there are three or four small, indistinct pale spots in a line from the costal margin across the end of the cell.

On the secondary the dark bands are a little more distinct than those of the males. On the under side the bands vary in distinctness, and the submarginal band is sometimes broken into a series of spots.

Length of one primary wing: male, 14 to 23 mm.; female, 16 to 18 mm.

TYPE MATERIAL: Holotype, male, and allotype, female, Freres, Haiti, May 30 and 27, 1930. Paratypes: all from Hispaniola; four males and two females, Port-au-Prince, Haiti, January 1-6, 15-23, 1922, February 11-18, 1922; one male and one female, Fond Parisien, Haiti, February 11-18, 1922; one male, St. Marc, Haiti, March 30-April 2, 1922; one female, Supplice, Haiti, March 31, 1922; one male, Freres, Haiti, May 27, 1930; three males and two females, Pétionville, Haiti, January 24-29, 1922, about 1700 feet, May 21, 23, 31, and June 4, 1930; one male, Chacquey, Dominican Republic, 1200 feet, February 26, 1930; one male and two females, Manzanillo Bay, Dominican Republic, February 27, 28, 1931; one male, 6 miles southwest of Santiago, Dominican Republic, 2000 feet, March 15, 1931. The following paratype is in the collection of the Academy of Natural Sciences of Philadelphia, Pennsylvania: one male, Port-au-Prince, Haiti, January 13, 1922.

The specimens comprising the type material show considerable variation in the size and superficial appearance of the males, but the females vary to a less extent. Male specimens bearing labels showing the dates of capture from January to the middle of March are small, and most of these individuals have one or two small, discal white spots on their primaries, although these are occasionally absent. Specimens showing dates of capture from April to June are larger than those of earlier dates of capture and have no trace of the discal spots. The male genitalia are the same in both forms.

In comparison with *Burca concolor* from Cuba, *hispaniolae* is a larger insect, the males have a much less mottled appearance of the wings, and the subapical spots of the primaries are a little larger. On the under side the ground color is paler as is also the overscaling. The females do not have the distinct dark bands of the upper side of the wings, and the subapical and discal spots are larger.

The form of the male genitalia is similar to that of *concolor* (fig. 13), but the details of the claspers present considerable difference which we consider to represent specific identity and not merely subspecific modification.

***Ephyriades dominicensis*, new species**

Figure 14

MALE: The upper side is a deep dark brown and immaculate. The fringes are concolorous.

The under side is of a slightly lighter color than the upper side. The inner margins of the primaries are much paler than the remainder of the wings.

The upper side of the thorax and abdomen is the same color as the wings, the head and collar are brown intermixed with bluish white scales, and there is a ring of bluish white scales around the third joint of the palpi. On the under side the palpi are brown and whitish intermixed, the pectus is brown with a few pale scales near the base, the thorax and abdomen are brown. The antennae are black on the upper side and spotted with whitish on the under side. The club is pale brown.

Length of one primary wing: 24 mm.

TYPE MATERIAL: Holotype, male, Roseau, Dominica, British West Indies, April 11, 1929 (E. I. Huntington).

This species is larger and lighter in ground color than *Ephyriades arcas* Drury (1770, p. 38, pl. 19, figs. 5, 6) but is about the same size as *Ephyriades brunnea jamaicensis* Möschler (1878, p. 226) from Jamaica. From the latter it differs in the absence of the white spots near the apex of the primaries and the hazy pale bands on the under side of the secondaries.

The male genitalia of *dominicensis* materially differ from those of both *arcas* and *brunnea*.

***Ephyriades brunnea floridensis*, new subspecies**

MALE AND FEMALE: Both sexes differ from *Ephyriades brunnea brunnea* Herrich-Schäffer (1864, p. 172) from Cuba in the average smaller size, particularly noticeable in the females. Furthermore, the ground color is slightly darker on both surfaces of the wings, and the hyaline spots of the primaries are a little smaller, those of the males showing a tendency towards obsolescence.

Length of one primary wing: male, 18 to 21 mm.; female, 16 to 19 mm.

TYPE MATERIAL: Holotype, male, and allotype, female, Key Largo, Florida, March 30, 1932. Paratypes: all from Florida: three males and one female, Key Largo, February 10, 1930, and March 30, 1932; one male and one female, Florida City, January 10 and May 7, 1932; one female, Homestead, April 18, 1923. The following paratypes are in the collection of Mr. Cyril F. dos Passos: four males and three females, Florida City, July 21, 24, 27, 1933, January 28, 1934, August 11, 1936; two males and two females, Goulds, July 21, 1939; two males and one female, Key West, March 26, 27, 1938.

The male genitalia apparently do not differ from those of *brunnea*.

A series of specimens from the Bahama Islands appear to be more closely related to Cuban *brunnea* than to this newly recognized subspecies from Florida.

***Copaodes stillmani*, new species**

Figure 15

MALE: The upper side is fulvous. Each primary has the outer half of the costal margin, all of the apical area, and the outer marginal third darkened, and in these areas the veins are black. The stigma is a long, narrow, black stripe in interspace 2, extending a little obliquely along the lower edge of the cell.

Each secondary has a black costal margin extending to a little below vein 7; vein 6 is black, and all the veins below it are black or darkened, particularly so towards the outer margin.

On the under side the upper half of each primary is fulvous but black thence to the inner margin. This area is variably incised by a fulvous spot in interspace 1 above the inner angle. The costal margin is black, and all the veins are black in the outer third of the wing.

The under side of the secondary, from the costal margin to vein 2, is a paler fulvous than that of the primary, but below vein 2 the color is a little deeper. All the veins are broadly black.

The upper side of the head and body is fulvous. On the under side, the palpi are fulvous towards the apex and white with scattered dark hairs below. The pectus, thorax, and abdomen are white. The antennae are black on the upper side and spotted

with fulvous beneath. The club is fulvous, blackened at the apex. The third palpal joint is very long, slender, and sharply pointed.

FEMALE: Similar to the male. The veins on both sides of the wings are more heavily blackened, and the dark marginal area of the upper side of the primaries is more extensive.

Length of one primary wing: male, 20 to 22 mm.; female, 24 mm.

TYPE MATERIAL: Holotype, male, and allotype, female, near Monte Christi, Dominican Republic, March 13, 1931. Paratypes: all from the Dominican Republic: five males and two females, near Monte Christi, March 13, 1931, and 1 mile east of Monte Christi, March 6, 1931.

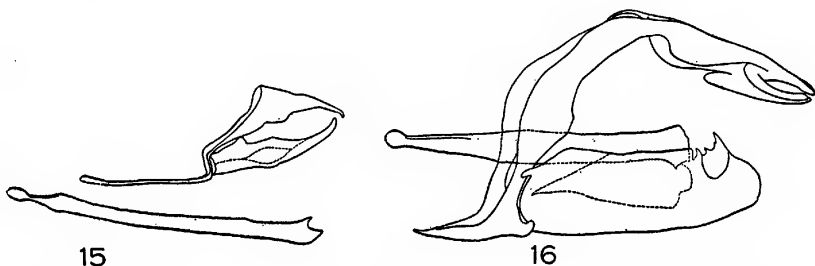


FIG. 15. *Copaeodes stillmani*, new species. Dominican Republic. Left lateral view of male genital armature with structures detached.

FIG. 16. *Atalopedes nabokovi*, new species. Haiti. Left lateral view of male genital armature with structures assembled.

This species is named for Mr. A. L. Stillman who collected all the specimens.

The short antennae and the antennal clubs, the palpi, and the stigmata of the male primaries appear to be quite the same as those of other species placed in the genus *Copaeodes*. The shape of the wings is similar to that of *Copaeodes minima* Edwards (1870, p. 196), but the primaries are a little less apically pointed.

***Atalopedes nabokovi*, new species**

Figure 16

MALE: The upper side is orange fulvous. The primaries have all of the veins black; the costal margin is dark brown in the basal

half with some orange fulvous overscaling at the base; the apex and outer margin are pale brown in color which gradually fuses into the orange fulvous of the disc. Within the brown area there are two small, diffused, orange fulvous spots between veins 4 and 6. The stigma is relatively very large but of the form characteristic of the species in this genus. All wings have a dark outer marginal line with fringes of orange fulvous blending into brown but with orange fulvous tips.

The veins of the secondaries are black, but the orange fulvous overscaling is so heavy that the veins do not show so prominently as on the primaries. The costal margin above vein 8, and in the basal half above vein 7, is brown.

The under side of each primary is orange fulvous; the costal margin narrowly dark brown and the apex and the outer margin suffused with pale brown. There is an indication of three small subapical spots and the two between veins 4 and 6; the base of the cell and just below it is black. The secondaries approach more nearly a yellow fulvous color; the costal and outer margins are pale brown, and there is a hazy indication of an angled discal band of small pale spots.

The upper side of the head, the thorax, and the abdomen is fulvous. On the under side, the palpi are yellowish white at the base, becoming more purely yellow apically. The pectus is yellow, the thorax is fulvous, and the abdomen is yellow. The antennae are brown on the upper side and fulvous on the under side; the club is black in the center and red at the apex.

FEMALE: The primaries are light brown. There is a discal band of three fulvous spots in interspaces 1 to 3. There are two small fulvous spots, one each in interspaces 4 and 5; three small subapical spots of the same color and a similarly colored spot in the end of the cell which is extended backward narrowly along the upper and lower edges of the cell. There are some orange fulvous scales at the base of the wings and along the costal margin. There is a dark outer marginal line, and the fringes are brown at the base and fulvous outwardly.

The secondaries are orange fulvous in the discal and inner marginal areas, the costal margin is brown, and the outer margin is broadly the same color overscaled with orange fulvous which becomes more diffuse towards the outer margin. In each wing there is an angled band of faintly defined pale spots in the disc and a hazy indication of a pale spot in the cell on its lower edge. There is a

dark outer marginal line, and the fringes are fulvous up to the outer angle where they become whitish.

On the under side the basal half of each primary is orange fulvous above vein 2 and black below it. Otherwise the wing is pale fulvous except the apical area which is light brown. The discal spots in interspaces 2 and 3 are present but less distinct than on the upper side; the three subapical spots are present, but the upper one is barely visible, and all are white; the two small spots in interspaces 4 and 5 are present, and they are white. The secondaries are light brown, overscaled with pale fulvous but not heavily so. The abdominal fold is fulvous. On each wing there is a discal band of six white spots, the lower four produced in an outwardly oblique line from vein 2 to vein 6, the upper two angled inwardly to vein 8. There is a white spot in the base of interspace 7, another on the lower edge of the cell at the rise of vein 3, and another just below the cell at the rise of vein 2. The fulvous part of the fringes is of a paler shade than on the upper side, and the whitish part is extended down to vein 2. The dark outer marginal line is present but less developed than on the upper side.

The upper and under sides of the body, the head, pectus, and antennae are similar to those of the male.

Length of one primary wing: male, 20 mm.; female, 18 mm.

TYPE MATERIAL: Holotype, male, Thomazeau, Haiti, September 4, 1934 (D. M. Bates); allotype, female, Fond Parisien, Haiti, February 11-18, 1922. The holotype male is in the collection of the Museum of Comparative Zoölogy at Harvard College, Cambridge, Massachusetts, and the allotype female is in the collection of the American Museum of Natural History.

This species is named for Mr. V. Nabokov of the Museum of Comparative Zoölogy.

In superficial appearance *nabokovi* more nearly resembles *Atalopedes campestris* Boisduval (1852, p. 316) from the mainland than it does *mesogramma* Latreille (1822, p. 765) from Cuba or the subspecies *apa* Comstock (1944, p. 559) from Puerto Rico and Hispaniola. The male of *nabokovi* is much larger and more extensively orange fulvous than the male of *campestris*, but the females of the two species bear more resemblance to each other, although they are not likely to be confused as *campestris* is confined to the mainland as far as we know. The male genitalia show specific differences from those of *campestris*, the unci and the terminations of the claspers being different in the two species.

BIBLIOGRAPHY

BOISDUVAL, JEAN ALPHONSE

1852. *Lépidoptères de la Californie*. Ann. Soc. Ent. France, Paris, ser. 2, vol. 10, pp. 275-324.

BUTLER, ARTHUR GARDINER, AND HERBERT DRUCE

1872. Descriptions of new genera and species of Lepidoptera from Costa Rica. *Cistula Ent.*, London, vol. 1 (1869-1876), pp. 95-118.

COMSTOCK, WILLIAM PHILLIPS

1944. Scientific survey of Porto Rico and the Virgin Islands. *Insects of Porto Rico and the Virgin Islands*. New York, New York Academy of Sciences, vol. 12, pt. 4, pp. 421-622, pls. 1-12.

CRAMER, PIERRE

1779. *Papillons exotiques des trois parties du monde l'Asie, l'Afrique et l'Amérique*. Amsterdam, vol. 3 (1779-1780), pp. 1-176, pls. 193-288.

DEWITZ, HERMANN

1877. *Tagschmetterlinge von Porto Rico*. Ent. Zeitschr., Stettin, vol. 38, pp. 233-245, pl. 1.

DRURY, DRU

1770. *Illustrations of natural history*. London, vol. 1, pp. i-xxviii, 1-130, [1-2], pls. 1-50.

EDWARDS, WILLIAM HENRY

1870. Descriptions of new North American diurnal Lepidoptera. *Trans. Amer. Ent. Soc.*, Philadelphia, vol. 3, pp. 189-196.

FABRICIUS, JOHANN CHRISTIAN

1775. *Systema entomologiae, sistens insectorum*. Flensburg and Leipzig, pp. 1-832.

1787. *Mantissa insectorum sistens eorum*. Copenhagen, vol. 2, pp. 1-382.

GODMAN, FREDERICK DUCANE, AND OSBERT SALVIN

1884. A list of the Rhopalocera collected by Mr. G. French Angas in the Island of Dominica. *Proc. Zool. Soc. London*, pp. 314-320, pl. 25.

1893. *Biologia Centrali-Americana. Insecta, Lepidoptera-Rhopalocera*. [London], vol. 1 (1879-1886), pp. i-xlvi, 1-487; vol. 2 (1887-1901), pp. i-iii, 1-782; vol. 3 (1879-1901), pls. 1-112. Godman only after vol. 2, p. 456; vol. 3, pl. 90.

HERRICH-SCHÄFFER, GOTTLIEB AUGUST WILHELM

1864. *Die schmetterlingsfauna der Insel Cuba*. *Corresp.-Blatt Zool.-Min. Ver. Regensburg*, vol. 18, pp. 159-172.

HÜBNER, JACOB

- 1806-1838. *Sammlung exotischer Schmetterlinge*. Augsburg, vol. 1 (1806-1819), pp. 1-36, pls. 1-213; vol. 2 (1819-1827), pp. 1-4, pls. 1-225; vol. 3 (1827-1838), pls. 1-53.

- 1816-1826. *Verzeichniss bekannter Schmettlinge*. Augsburg, pp. 1-431, 1-72.

KAYE, WILLIAM JAMES

1926. The butterflies of Jamaica. *Trans. Ent. Soc. London* (1925), pp. 455-504.

LATREILLE, PIERRE ANDRÉ

1822. *Encyclopédie méthodique. Histoire entomologique, ou histoire naturelle*

- des crustacés, des arachnides et des insectes. Paris, vol. 9 (1819-1823), pp. 1-828.
- LUCAS, PIERRE HIPPOLYTE
1857. Ordre des lépidoptères. Histoire physique, politique et naturelle de l'Ile de Cuba par Ramon de la Sagra. Paris, Natural History, vol. 7, pt. 2, pp. 474-750, pls. 14-17.
- MÖSCHLER, HEINRICH BENNO
1876. Beiträge zur Schmetterlings-Fauna von Surinam. Verh. Zool.-Bot. Gesellsch. Wien, vol. 26, pp. 293-352, pls. 3, 4.
1878. Neue exotische Hesperidae. *Ibid.*, vol. 28, pp. 203-230.
- PANTON, E. STUART
1897. The life-history of some Jamaica Hesperiidæ. Jour. Inst. Jamaica, Kingston, vol. 2, pt. 5, pp. 435-441, pl. 1.
- POEY, FELIPE
1832. Centurie de lépidoptères de l'Ile de Cuba. Paris, first decade, pp. [1-30], pls. [1-10].
- SCUDDER, SAMUEL HUBBARD
1872. A systematic revision of some of the American butterflies; with brief notes on those known to occur in Essex County, Mass. Fourth Ann. Rept. Peabody Acad. Sci., (1871), Salem, Massachusetts, pp. 24-83.
- SKINNER, HENRY
1920. Descriptions of new species of Hesperidae. Ent. News, Philadelphia, vol. 31, pp. 132-135.

